

FEATURES

- ☐ Supports up to 64 terminals/peripherals
- ☐ Full 32-bit architecture
- ☐ High-speed MC68020 CPU operating at 16.7 MHz
- ☐ Integrated MC68881 math chip operating at 25.0 MHz
- ☐ Advanced, Triple-Cache™ architecture
- ☐ UNIX System V.2 featuring Demand Paged Virtual Memory (with Berkeley enhancements)
- ☐ Expandable to 16 megabytes of error-correcting RAM
- ☐ Standard 120 megabyte cartridge tape backup
- ☐ Up to 350 megabytes of hard disk storage on dual 175 megabyte disk drives

INTRODUCTION

Cromemco is an industry leader in the development of high performance computer systems. As with all our products the CS460 is designed for reliability as well as performance. Long time customers, such as the U.S. Air Force, depend on Cromemco because our products consistently exceed their expectations of longevity and durability. Products are designed and can be manufactured to meet exacting military standards (such as MIL-STD 9858A, 480 and 483) further insuring product quality and integrity.

DESCRIPTION

The System 460 is a high performance supermicro-computer that offers an outstanding combination of speed, flexibility, rugged design and advanced packaging. It is designed to meet the rigorous demands of the multi-user, multi-tasking UNIX world. The CS460 is unique in its strong combination of minicomputer power and performance at supermicrocomputer prices.

The advanced design of the 32-bit CS460 extracts very high performance from both hardware and software. With its large system memory (up to 16 Mb), huge internal Winchester capacity, and ability to support up to 64 terminals/peripherals, the CS460 is designed to outperform traditional minicomputers. The CS460, combined with the industry standard

UNIX V.2 operating system and a wide variety of hardware and software options, makes the CS460 the ideal computing engine in a variety of applications.

PERFORMANCE PLUS

The CS460 utilizes the fast MC68020 operating at 16.7 MHz as its central processing unit (CPU). This 32-bit chip, combined with the MC68881 fast math chip operating at 25.0 MHz, enables the computer to perform over 1,300,000 Whetstones per second.

Cache for Speed

The high operating speed of the System 460 is achieved largely through its cache-intensive design. Virtually every major system element — from CPU, to hard disk controller, to serial I/O controller — contains a local, high-speed buffer which serves to reduce bus traffic and increase operating speed. This extensive use of cache memory plays a major role in creating the CS460's high performance.

On the XXU processor board alone, Cromemco has placed a large 16 Kb of high speed cache memory. This is 64 times that resident on the MC68020 chip and up to four times that found in many high performance supermicrocomputers available today.

In addition to utilizing a large cache, Cromemco has made it **two-set associative cache**. Two-set associative cache is a state-of-the-art method of increasing cache efficiency. Less time is spent trying to input data to the cache memory resulting in faster task completion by the CPU.

This type of high performance cache is more commonly found in mainframe rather than supermicro-computers. By implementing proven technology from larger systems Cromemco is providing a computing solution that is reliable as well as fast.

Extensive High-Speed Memory

As with all other Cromemco systems, the CS460 supports a large quantity of system and peripheral memory. Memory can be expanded up to 16 Mb in 2 Mb increments. Both error correcting (ECC) and non-error correcting memory are offered.

As many as two hard disk drive units may be mounted internally. This gives the CS460 350 megabytes of internal storage. All disk I/O functions are supported by the ESDC hard disk controller board. The ESDC provides read-after-write verification, 196 Kb cache memory, and Direct Memory Access to the host address space. In addition, two ESDC boards in a system support overlapped seeks for increased data throughput in the dual drive configuration of the CS460.

Comprehensive Diagnostics

Each time the CS460 is powered on, a comprehensive set of diagnostics, called XDOS, is executed. XDOS provides the operator with the operational

status of the system. XDOS provides a thorough test of components including the CPU, memory, and I/O devices. It even checks itself by testing the ROM on which it is resident. Through XDOS and a modem it is also possible to perform remote diagnostics.

Single-User, Multi-User

The standard CS460 is configured to support up to 8 terminals/peripherals through serial ports. This makes it ideal as a computing engine in software development, or as a distributed processing system.

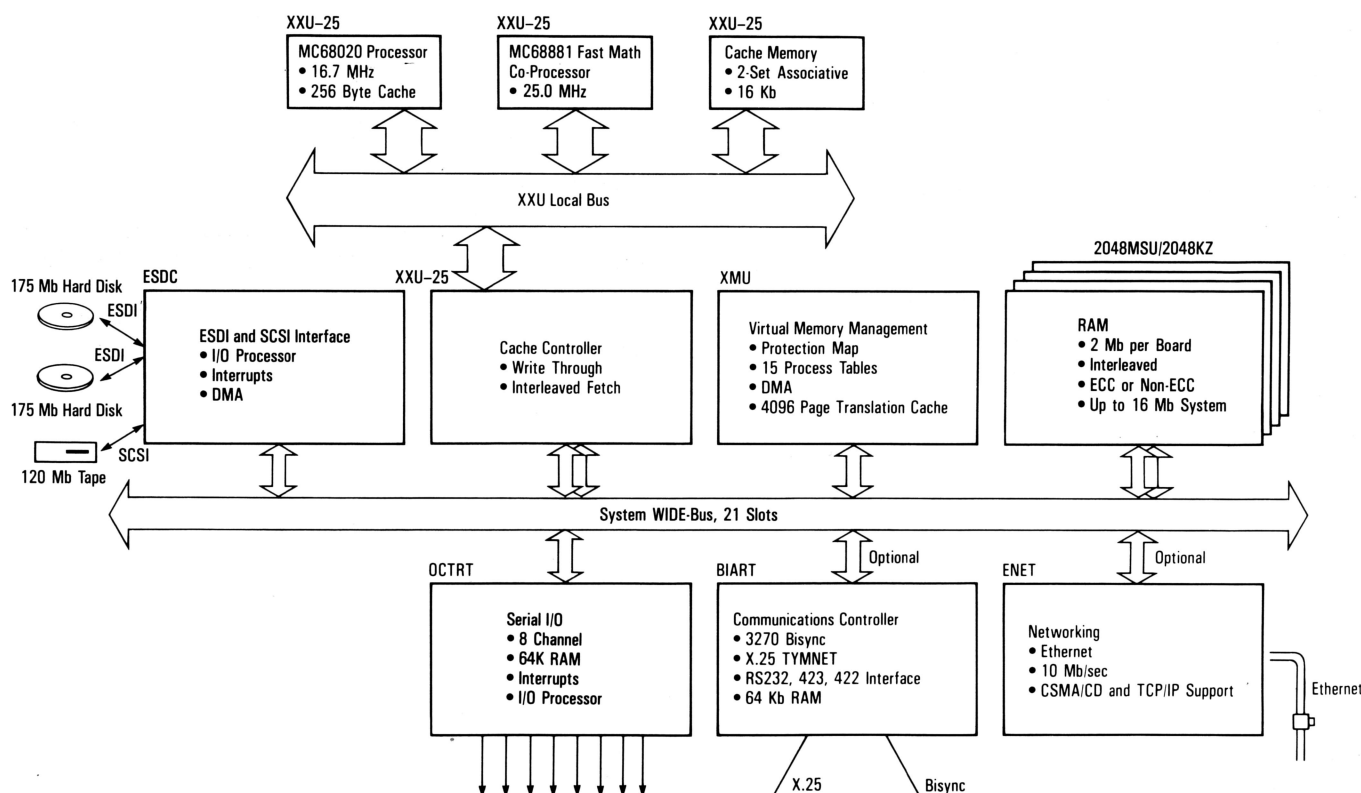
Additional OCTART boards, each supporting 8 channels, may be added to the system to provide up to 64 serial ports.

The Power of UNIX

Whether your application requires FORTRAN programming for scientific purposes or a 4th Generation Language (4GL) for commercial applications, UNIX System V.2 provides the power and versatility that you need. Originally developed by Bell Laboratories, UNIX V.2 has wide acceptance as the standard operating system on high performance supermicro-computers. Cromemco's UNIX V.2 adheres to industry standard enhancements, such as record and file level locking and TCP/IP. It supports such powerful features as Demand-Paged Virtual Memory, Common Object File Format (COFF), Job Control (Shell layering), and User **cron** Facility.

Included with Cromemco's UNIX are the highly acclaimed Berkeley enhancements, which include CShell, TERMCAP, and VI. Also included is **ce**, Cromemco's highly functional screen editor. This editor has all the power of VI, but is much easier to use.

SYSTEM DIAGRAM



INTERNAL 120 MEGABYTE TAPE BACK-UP

The CS460 includes an integral 120 Megabyte Cartridge Tape Drive for fast data storage back-up and software interchange. This tape drive uses standard DC-600A tape cartridges and records using the QIC-120 recording standard.

USER-ORIENTED MECHANICAL DESIGN

The System 460 implements advanced design in the areas of cooling, power supply, and operator convenience. The front panel pilot lamp performs the triple functions of telling the operator that the system is on, that the air temperature in the box is at a safe level, and that all power supply voltages are within proper range. Similarly, an array of diagnostic indicators inside the box allow for an instant assessment of system status.

The airflow scheme in the System 460 is bi-level; separate thermal environments are maintained for the boards and peripherals. This allows the sensitive magnetic storage devices to operate without adverse effect from the heat produced by the logic boards. Twin thermal sensors feed information to a fan controller circuit which regulates the internal airflow.

A keylock on the power/reset switch ensures that a key operator can maintain control over the system. A second lock protects the card cage area and requires

a separate key. This implements two levels of security over the data and physical components.

MANY OPTIONS

In addition to the CS460's high-performance, standard features, Cromemco offers many optional products that are designed to increase the system's functionality.

In the area of communications the optional BIART board supports both 3270 bisync for Micro-to-Main-frame communication, and X.25 — the worldwide public data carrier network. Interface is accomplished through either RS-232, RS-422, or RS-423 serial channels.

Ethernet is supported with the optional E-Net board set and B-Net software package. This implementation supports CSMA/CD protocol in hardware and TCP/IP protocol in software.

Optional board products which support NTSC or PAL graphics, printers, peripherals, and other devices are also available.

EXTENSIVE SOFTWARE

Cromemco offers an extensive line of software to help the user take full advantage of UNIX's capabilities. For programmers, Cromemco offers a full line of

SYSTEM SPECIFICATIONS AND PRODUCT SUMMARY

MODEL	CS460EH175XX40	CS460EH175XX40E	CS460EH350XX40	CS460EH350XX40E
Processor	MC68020, 16.7 MHz			
Math Co-Processor	MC68881, 25.0 MHz			
Cache Memory				
Processor (XXU)	16 Kb			
Serial I/O (OCTRT)	32 Kb			
Winchester Controller (ESDC)	196 Kb			
RAM (expandable to 16 Mb)	4 Mb	4 Mb	4 Mb	4 Mb
Error-Correcting Memory (ECC)	No	Yes	No	Yes
ROM Firmware	XDOS diagnostics, with extensive system diagnostics			
Serial Interface	RS-232 or current loop, 8 channels, expandable to 64			
Cartridge Tape Storage*	120 Mb (Reads standard 60 Mb QIC-24 tapes or 120 Mb QIC-120 tapes)			
Hard Disk Storage*	175 Mb	175 Mb	2-175 Mb	2-175 Mb
Boards Supplied	XXU-25 XMU OCTRT ESDC 2-2048KZ	XXU-25 XMU OCTRT ESDC 2-2048MSU MCUX	XXU-25 XMU OCTRT 2-ESDC 2-2048KZ	XXU-25 XMU OCTRT 2-ESDC 2-2048MSU MCUX
Board Capacity	21 Boards			
Open Board Slots	15	14	14	13
Operating Systems Installed	UNIX System V.2			
Power	Operated from 100/115/130/220/240/260 volts, 50/60-cycle			
Power Consumption**	500 watts			
Power Supply	+8 volts @ 30A, +16 volts @ 10A, -16 volts @ 5A			
Dimensions	27½"H × 8½"W × 27½"D (69.9 cm × 21.6 cm × 69.9 cm)			
Weight	115 lbs (52.3 kg)			
Mounting	Free-standing, floor; casters			
Operating Environment	10-40°C			

*Unformatted Capacity.

**Maximum power consumption based on all slots being used.

development languages including C, FORTRAN-77, BASIC, and Pascal. An extremely capable 4th Generation Language, Informix 4GL is also available. This 4GL permits the development of applications in a fraction of the time required with conventional procedural languages. All software (listed below) is supplied on convenient DC-600A tape cartridges:

PRODUCT	DESCRIPTION
FOR-Q	Silicon Valley Software FORTRAN 77 compiler
PAS-Q	Silicon Valley Software Pascal compiler
CCC-Q	Silicon Valley Software C compiler
BAS-Q	Silicon Valley Software Basic Plus interpreter
UPST-Q	UNIX System V.2 programmer's software tools
UDST-Q	UNIX System V.2 documentor's software tools
BNET-Q	UNIX System V.2 Ethernet communications package (for use with Cromemco's ENET board set)

PRODUCT	DESCRIPTION
ISQL-Q	Informix relational data base structured query language
IESQL-Q	Informix C-programmer's version of ISQL for embedded structured query language
I4GL-Q	Informix fourth generation language
ICISAM-Q	Informix C-ISAM file access method
ISQLRT-Q	Run time only version of Informix ISQL
I4GLRT-Q	Run time only version of Informix 4GL
UPLX-Q	Uniplex II office automation system
UPMAIL-Q	Mail/Calendar accessory for Uniplex office automation system
UPREP-Q	Report writer for Uniplex office automation system
UNIFY-Q	Unify relational data base
UNIFYRT-Q	Run time only version of Unify relational data base
BASELIN-Q	Programmer's development tools for Cromemco's S-series graphics products
BASELINRT-Q	Run time only version of BASELINE

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